ABSTRACT OF THE DISCLOSURE

A magnet assembly and a magnetic field configuration are disclosed for the generation of a magnetic field in a defined volume, with the field being homogeneous over a pre-determined portion of the volume and not homogeneous over the rest. The disclosed magnetic assembly has a plurality of spaced-apart magnets arranged in pairs. The magnets of each pair are be positioned diametrically opposite each other with respect to an enclosed volume. In different embodiments magnets may all be arranged such that their magnetization directions are substantially aligned, or could alternatively be arranged to have magnetizations pointing in different directions. The angular spacing between the magnets is selected in the range of approximately 13° - 17° and could be as large as the size of the magnets. The assembly generates a homogeneous magnetic field within an inner portion of the defined volume, and a second magnetic field, substantially different from the homogeneous magnetic field throughout the remainder, i.e., in the periphery of the defined volume.